



***Energy Efficiency  
Path To Controllable Costs and Competitive Advantage***

***Cleaner Technology and Energy Efficiency Forum***

***April 5, 2007***



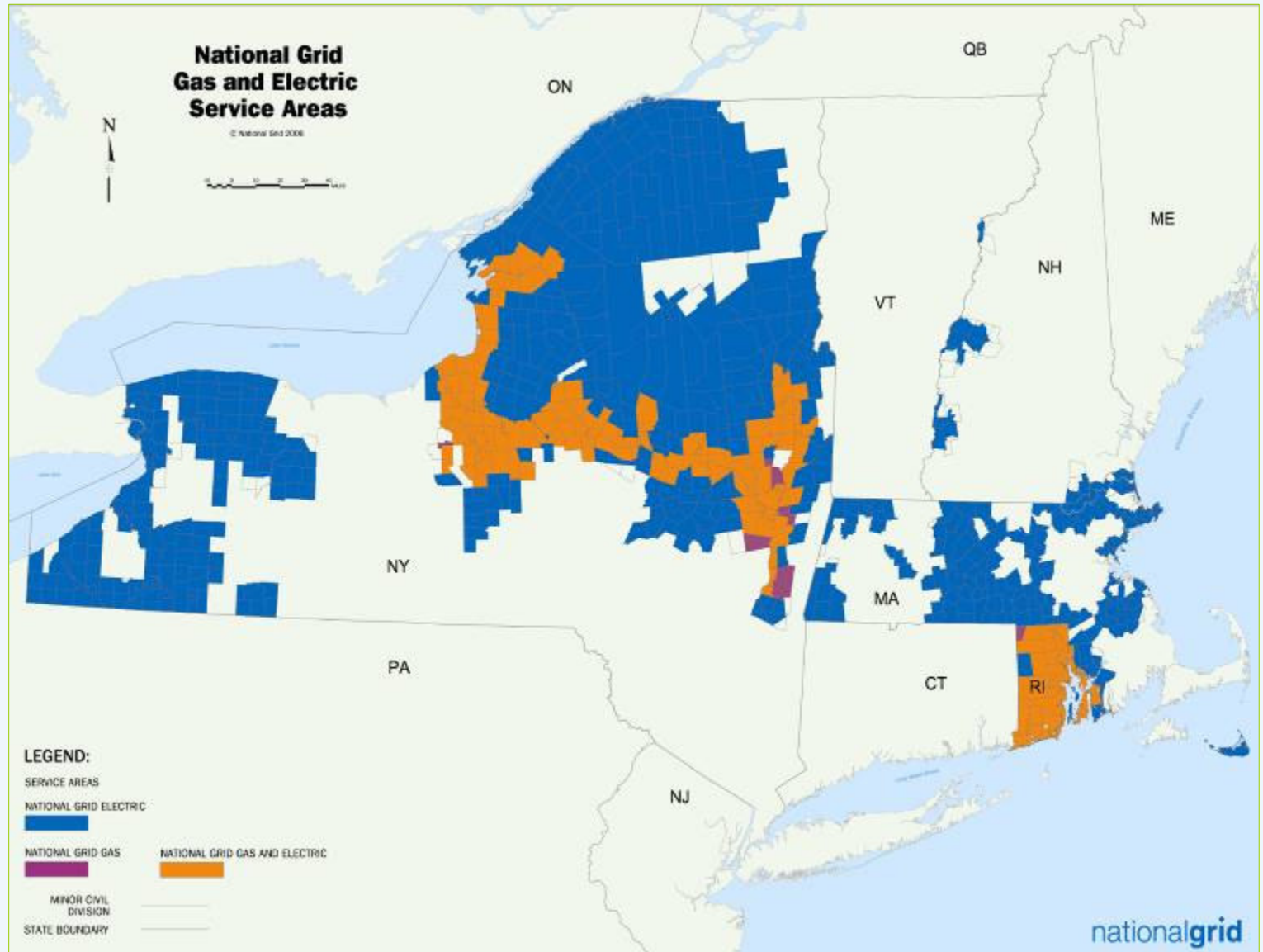
**nationalgrid**

# National Grid USA

National Grid USA is a wholly owned subsidiary of National Grid plc. National Grid's core U.S. business is the delivery of electricity and natural gas. National Grid is one of ten largest utilities (by number of customers) in the US.

National Grid's five retail electricity distribution companies serve ~3.4 million customers across 29,000 square miles in New York, Massachusetts, Rhode Island, New Hampshire and Nantucket. Its electricity distribution network includes 72,000 miles of lines.

National Grid delivers natural gas to ~569,000 customers in 216 communities in central and eastern New York and 245,000 customers in 33 communities in Rhode Island. The company maintains more than 11,700 miles of distribution pipe across 5,456 square miles of service territory in New York and Rhode Island.





## Buildings and Industry: Energy and Environment

- ◆ Use 1/3 of the Nation's primary energy  
(This becomes over 50% when taking into account the energy use of the infrastructure needed to support buildings.)
- ◆ Use 2/3 of the Nation's electricity and 1/3 greenhouse gas emissions

# Invest In Efficiency in Built and Natural Environments

---

## The Big Picture

- ◆ Stable, evolving programs for all customer sectors
- ◆ \$79 million annual budget in New England
- ◆ Participation by over 65% of all customers
- ◆ \$210 million in annual savings on customers' electric bills
- ◆ Demand reduction achieved to date equivalent to two combined cycle gas plants





# 2007 Planning Builds on Mature Programs

- ◆ **Large Business Programs:**

- ***Design 2000plus - New Construction***

- ✓ Installation of energy efficient equipment and systems for new construction, major renovations and replacement of failed equipment
    - ✓ Comprehensiveness and optimized systems through technical assistance
    - ✓ Incentives up to 80% of incremental costs

- ***Energy Initiative - Retrofit***

- ✓ Targets energy efficient opportunities for existing buildings and equipment
    - ✓ Replaces inefficient equipment or systems
    - ✓ Reduces owners operating costs
    - ✓ Incentives up to 45%

- ◆ **Small Business Program:**

- **Retrofit lighting and other custom services**

- **For customers with monthly demand of 200 kilowatts or less/480,000 kilowatt-hours or less**

- ✓ Provides a free energy audit and recommendation for energy efficiency improvements
    - ✓ Incentives of up to 80% of the cost of the installation of better performing equipment
    - ✓ Offers financing of the remaining 20% balance – interest free for up to 24 months

**nationalgrid**

# National Grid's Demand Response Effort

---

- ♦ **Educate customers on wholesale energy and capacity Markets**
- ♦ Enroll Customers in ISO Programs
  - ♦ Voluntary Price Response (Economic Program)
    - Over 10% of customers >200KW are enrolled
  - ♦ Real Time Demand Response (Reliability Program)
- ♦ Enroll customers in Targeted (Localized Reliability) Programs
  - ♦ Enhance reliability in an area with local constraints
  - ♦ Begin to integrate demand response with control room operations
- ♦ **Provide Demand Response Audits for Customers**
  - ♦ **Identify demand reducing measures and actions**
  - ♦ **Define a facility action plan**
  - ♦ **Estimate potential revenue from program participation and implementing the action plan**
- ♦ Deploying advanced real time wireless metering solutions for targeted and real time demand response customers

# DSM Portfolio

Estimated Annual Electric Energy Savings	1,445,267 kWh
Estimated Annual Energy Cost Savings	\$145,538
National Grid Incentive	\$67,736

## Lowell Regional Water



### Efficient Mechanical Equipment and Systems

- ◆ Variable Frequency Drives for pumps
- ◆ Magna Drive for pump
- ◆ Constant Speed Drive for pump

**nationalgrid**

# Labs

---

- ◆ **Extremely energy intensive (approx \$5/CFM)**
- ◆ **New methods dramatically reduce ventilation while maintaining / improving lab safety**
- ◆ **New practices and equipment can cut energy use by as much as 50%**
- ◆ **ROI's of 20%, 30% even 100% possible on new and existing labs**

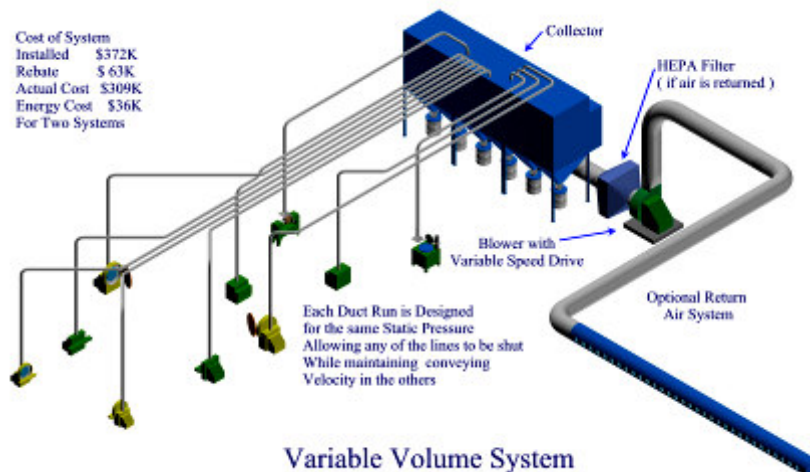




# DSM Portfolio

Estimated Annual Electric Energy Savings	193,218 kWh
Estimated Annual Energy Cost Savings	\$17,080
National Grid Incentive	\$63,089

## Saint-Gobain



## Efficient Mechanical Equipment

- ◆ Variable Volume Constant Pressure Dust Collection System

**nationalgrid**

# DSM Portfolio

Estimated Annual Electric Energy Savings	423,605 kWh
Estimated Annual Energy Cost Savings	\$42,657
National Grid Incentive	\$205,743

## Worcester Envelope



## Efficient Mechanical Equipment and Controls

- ◆ Dry vacuum system capable of achieving higher vacuum levels

# DSM Portfolio

## Raytheon

Estimated Annual Electric Energy Savings	2,857,316 kWh
Estimated Annual Energy Cost Savings	\$399,495
National Grid Incentive	\$750,792



### High Performance Lighting Systems and Controls

- ◆ Installed high quality energy efficient Ergolight™ fixtures with 3 T8 lamps in each fixture
- ◆ Fixtures incorporate daylight and occupancy sensors and addressable controls

**nationalgrid**

## Efficiency – 1<sup>st</sup> Line of Defense for Controllable Cost

---

- ◆ Lower operating costs help sustain operations
- ◆ Improved building performance for higher productivity
- ◆ Cash incentives reduce construction cost
- ◆ Added value enhances investment

# Integrated Design Benefits

## ***National Grid's Success with Integrated Design Strategies***

- ◆ 11,092,296 sq. ft. affected all building sectors
- ◆ 30,714,316 annual kWh savings
  - ◆ 558,387 MWh over expected lifetime
- ◆ \$25,530,433 customer value
- ◆ \$8,822,802 incentives paid
- ◆ Added design cost \$.25/SF
- ◆ Operating cost savings \$.24/SF to \$.50/SF



**nationalgrid**



# Whole Building Assessment Good Initial Step

- ◆ Provide expert advice on ways to lower energy costs
- ◆ Identify and implement cost-effective and energy-efficient projects
- ◆ Promote use of EPA's Energy Performance Rating System for ongoing performance measurement
- ◆ Furnish written action plan with following up on recommendations and installation
- ◆ Track resource consumption and costs
- ◆ Stimulate resource efficiency interest among staff
- ◆ Compare facility energy use to that of similar facilities



**nationalgrid**

# Retro-Commissioning – 2007 Enhancement

---

## Continue to...

- ◆ Examine low cost/no cost measures
- ◆ Match the capital improvement effort
- ◆ Grow capable firms to deliver services
- ◆ ESCOs and control firms play a key part in the success of the retro-commissioning efforts



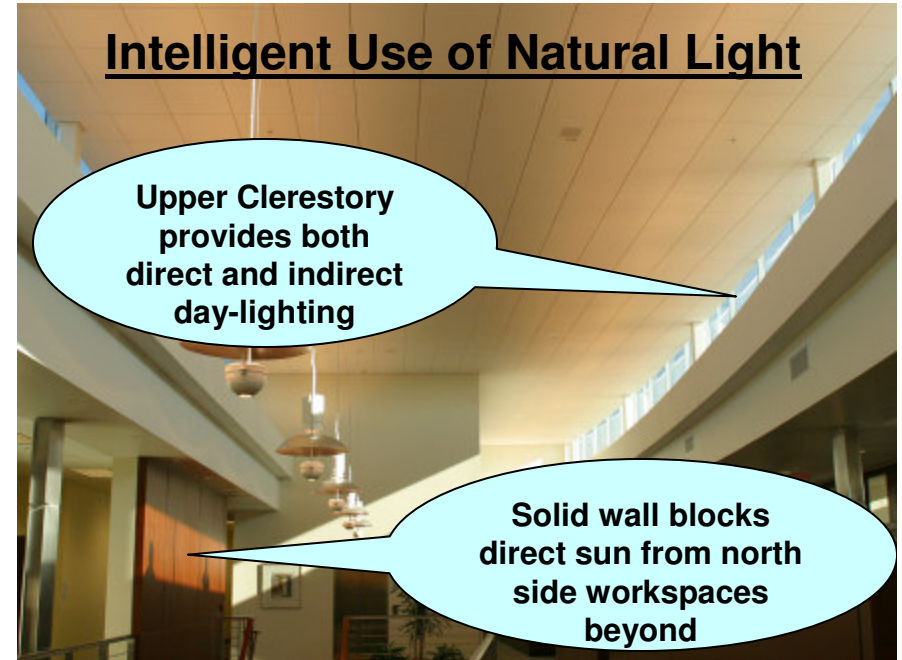
## Early lessons

**Energy efficiency opportunities  
(*low cost measures*)**

**Preventative maintenance and  
pneumatic control devices**

# High Performance Lighting - Next Opportunity

- ◆ High Performance Lighting
  - Designlights™ knowhow™ guides for schools and office
  - Circuit rider for cites and towns, architects, design engineers, and lighting distributors
    - ✓ Promote programs and act as a resource
  - Possibility of providing a stocking incentive for distributors to stock fixtures with “High Performance T-8’s”



# Commonwealth Supports Green Design and Better Environmental Practices

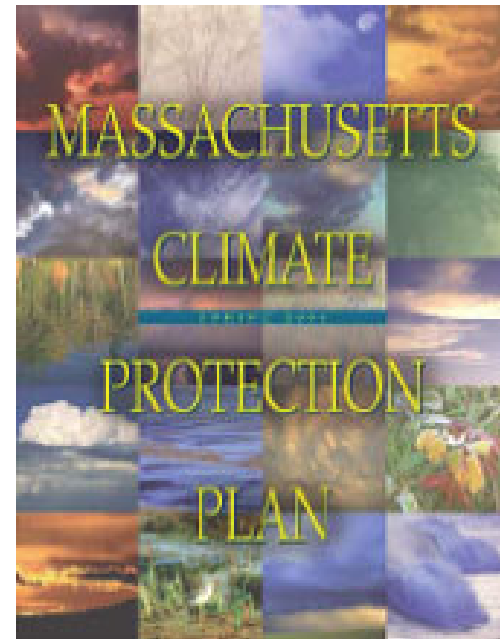
---

Massachusetts Adopts USGBC's LEED Standard (August 2006)

- ◆ All new public buildings will be LEED Certified.

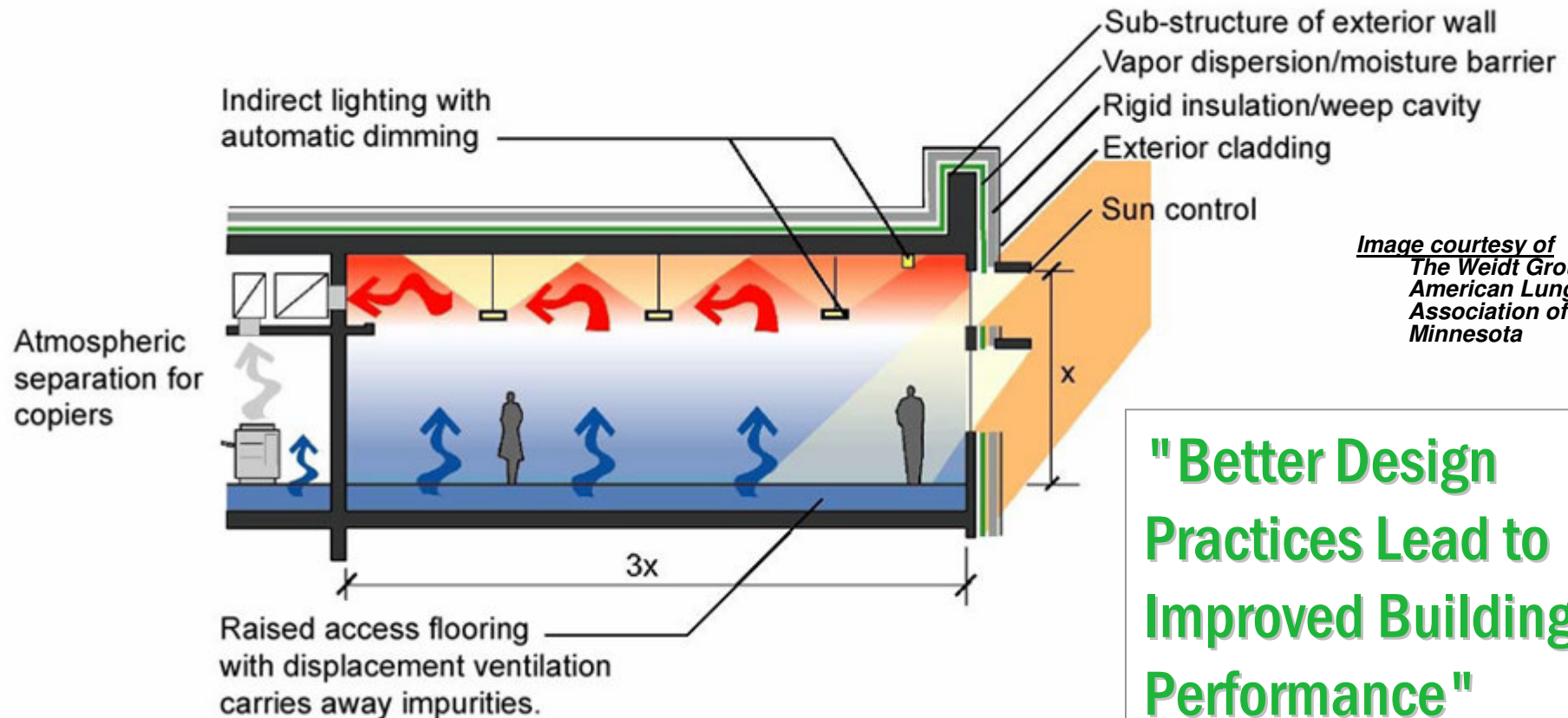
Massachusetts Climate Action Plan

- ◆ Emphasis on High Performance Buildings and Smart Growth Principles



# Summary

- ◆ Changes in Built Environment Compliment Utility Services
- ◆ Utilities Well Poised to Integrate Market Choices:
  - High Performance Design; Green Design; Sustainable Design; Whole Building Design; LEED Design; and Energy Star Design





## How to Get Started On Next Project

---

- ◆ Work closely with the Company's Key Account Manager
- ◆ For complex projects, a Technical Consultant or Design Liaison can be assigned
- ◆ **[www.nationalgridus.com](http://www.nationalgridus.com)**